UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte KIRK HOGAN

Appeal No. 2006-1560
Application No. 09/613,887

ON BRIEF

Before ADAMS, GRIMES, and GREEN, Administrative Patent Judges.

GRIMES, Administrative Patent Judge.

DECISION ON APPEAL

This appeal involves claims to a method of screening patients for risk of surgical complications, which the examiner has rejected a obvious. We have jurisdiction under 35 U.S.C. § 134. We affirm the rejection.

Background

"Although surgery saves many lives, surgical complications result in many instances of mortality and morbidity. Complications related to surgery and anesthesia include infections, excessive blood loss, thrombosis, nausea and vomiting, and anesthesia reactions." Specification, page 1.

"One anesthesia-related complication is malignant hyperthermia (MH). MH is an autosomal dominant trait that causes a severe, uncontrollable fever when anesthesia is administered." Id. "[M]uscle relaxants commonly given in conjunction with anesthesia, such as succinylcholine or mivacurium, can cause prolonged paralysis and apnea in a patient after the patient has awoken from anesthesia. The paralysis, caused by mutations in the butyrylcholinesterase gene (BChE), is inherited as an autosomal recessive trait.. . . In addition, subjects with mutations in Cytochrome P450 enzymes . . . can have adverse reactions due either to the inability to activate or metabolize certain drugs (e.g., morphine derivatives and anti-dysr[hy]thmics). Complications can be avoided by substituting other medications or adjusting dosage." Page 2.

Despite these known, genetically determined susceptibilities to side effects of anesthesia, however, "the current state of the surgical field is to reduce or eliminate perioperative testing." Specification, page 5. "[T]he current procedure is simply to ask a patient if they have had any previous difficulties with anesthesia or surgery. . . . The use of laboratory tests for relatively healthy patients has generally been reduced or eliminated. Reasons for elimination include the cost of screening tests, inaccuracy and lack of specificity, [and] uncertainty as to how to alter treatment course of action in response to results." Id.

The specification discloses "methods for perioperative genomic screening of subjects, in particular . . . perioperative screening for markers indicative of responses to anesthesia and other perioperative or operative treatments and procedures." Page 3. "Markers for inclusion are selected for their accuracy, specificity, and predictive value. The perioperative profiles . . . allow for the individualization of treatment options for each

subject." Page 6. "Markers are also selected for which the course of action can be altered in a time and cost effective way to eliminate or reduce unwanted surgical complications. For example, a practitioner may cho[o]se a particular anesthetic or analgesic in order to avoid a life-threatening response." Id.

Discussion

1. Claim construction

Claims 74-105 are pending and on appeal. Claim 74 is representative and reads as follows:

> 74. A method of screening a patient perioperatively to determine a risk for complications during a surgical procedure associated with known genetic variations comprising:
>
> a) obtaining a sample form a perioperative subject, said perioperative subject being a patient scheduled for a surgical procedure that has not yet completed said surgical procedure; and
>
> b) subjecting said sample to an assay for detecting two or more nucleic acid genetic markers in two or more genes associated with two or more conditions to generate a genomic profile for use in selecting a perioperative course of action, wherein said subjecting step occurs after said patient is scheduled for surgery but before completion of said surgical procedure, thereby determining a risk for complication during said surgical procedure.

"It is axiomatic that, in proceedings before the PTO, claims in an application are to be given their broadest reasonable interpretation consistent with the specification and that claim language should be read in light of the specification as it would be interpreted by one of ordinary skill in the art." In re Sneed, 710 F.2d 1544, 1548, 218 USPQ 385, 388 (Fed. Cir. 1983) (citation omitted).

In addition, "while it is true that claims are to be interpreted in light of the specification and with a view to ascertaining the invention, it does not follow that

limitations from the specification may be read into the claims." Sjolund v. Musland, 847 F.2d 1573, 1581, 6 USPQ2d 2020, 2027 (Fed. Cir. 1988) (emphasis in original). On the contrary, "the claims define the invention. . . . [L]imitations from the specification are not to be read into the claims." Id. at 1582, 6 USPQ2d at 2027.

Here, claim 74 is directed to a method the comprises obtaining a sample from a patient and testing the sample for the presence of "two or more nucleic acid genetic markers in two or more genes associated with two or more conditions." The results of the testing form the basis for "determining a risk for complications during said surgical procedure"; thus, the "conditions" recited in the claim are those associated with "a risk for complications during a surgical procedure associated with known genetic variations," as recited in the preamble.

Claim 74 also states that the results of the "assay for detecting two or more nucleic acid genetic markers . . . generate[s] a genomic profile." The specification states that "a 'genomic profile' refers to a set of information about a given 'subject's' genes (e.g., the presence or absence of a specific set of mutations or 'SNPs')." Page 23, lines 7-9. Thus, the "genomic profile" recited in claim 74 merely refers to the data resulting from the recited "assay for detecting two or more genetic markers."

Claim 74 also states that the genomic profile is "for use in selecting a perioperative course of action." This claim language, however, merely recites an intended use for the data resulting from the assay step in the claim. "An intended use or purpose usually will not limit the scope of the claim because such statements usually do no more than define a context in which the invention operates." Boehringer Ingelheim Vetmedica v. Schering-Plough Corp., 320 F.3d 1339, 1345, 65 USPQ2d

1961, 1965 (Fed. Cir. 2003). Therefore, claim 74 is not limited to a process that includes selecting a perioperative course of action based on the results of the assay.

2. Obviousness

The examiner rejected claims 74-105 under 35 U.S.C. § 103 as obvious in view of Miller,[1] Quane[2] or AAS,[3] La Du[4] or Pharmacogenetics,[5] Evans[6] or Poort,[7] Hoon,[8] and Hacia.[9]

The examiner characterized Miller as teaching "screening a patient preoperatively to determine a risk for complications during a surgical procedure," although she acknowledged that Miller does not teach testing for "two or more known genetic variations associated with two or more conditions." Examiner's Answer, page 4.

However, the examiner cited Quane for its disclosure of "novel common mutations in [the] ryanodine receptor gene (RYR1) in malignant hyperthermia (MH)" and noted that Quane teaches that "once an individual is diagnosed as being susceptible to MH, the anesthetics which trigger this syndrome can be avoided." Id. The examiner

---

[1] Anesthesia, Vol. 2, Miller (ed.), pp. 1323-1333, Churchill Livingstone, NY (1981)
[2] Quane et al., "Detection of a novel common mutation in the ryanodine receptor gene in malignant hyperthermia: implications for diagnosis and heterogeneity studies," Human Molecular Genetics, Vol. 3, pp. 471-476 (1994)
[3] La Du, "Butyrylcholinesterase variants and the new methods of molecular biology," Acta Anaesthesiologica Scandinavica, Vol. 39, pp. 139-141 (1995)
[4] La Du et al., "Proposed nomenclature for human butyrylcholinesterase genetic variants identified by DNA sequencing," Cellular and Molecular Neurobiology, Vol. 11, pp. 79-89 (1991)
[5] The reference is cited as "Pharmacogen[e]tics, Chapter 4, pp. 309-326" in the Information Disclosure Statement received April 6, 2001 (reference number 202 in the IDS).
[6] Evans et al., "Pharmacogenomics: Translating functional genomics into rational therapeutics," Science, Vol. 286, pp. 487-491 (1999)
[7] Poort et al., "A common genetic variation in the 3'-untranslated region of the prothrombin gene is associated with elevated plasma prothrombin levels and an increase in venous thrombosis," Blood, Vol. 88, pp. 3698-3703 (1996)
[8] Hoon et al., U.S. Patent 6,057,105, issued May 2, 2000.
[9] Hacia, "Resequencing and mutational analysis using oligonucleotide microarrays," Nature Genetics Supplement, Vol. 21, pp. 42-47 (1999)

also cited AAS for its disclosure that certain variants of the butyrylcholinesterase (BChE) gene cause patients to react differently to the muscle relaxant drug succinylcholine. Id. The examiner also noted AAS's advice that anesthesiologists need to keep up to date about the application of molecular biology tests to BChE variants. Id.

The examiner cited La Du, Pharmacogenetics, and Evans as disclosing genetic variations that are associated with abnormal responses to drugs. See the Examiner's Answer, pages 6-7:

> La Du . . . teaches butyrylcholinesterase variants which have been found in individuals who have responded abnormally to the muscle relaxant succinylcholine. . . .
>
> Pharmacogenetics teaches polymorphisms of desbrisoquine [sic] hydroxylase (Cytochrome P4502D6). The structures of CYP2D gene clusters are provided. The poor metabolizers are depicted. . . . Codeine is [an] ineffective analgesic in the 5-10% of the population who have a PM [poor metabolizer] phenotype.
>
> Evans . . . teaches the drug-metabolizing enzyme debrisoquine hydroxylase (CYP2D6) is polymorphic. . . . Evans teaches that "many opioid analgesics are activated by CYP2D6 rendering the 2-10% of the population who are homozygous for nonfunctional CYP2D6 mutant alleles relatively resistant to opioid analgesic effects. . . ."

The examiner cited Poort's disclosure that a "20210 AG gen[ot]ype of the prothrombin gene . . . is a candidate for venous thrombosis in patients. It is well known in the art that venous thromboembolism can occur without apparent cause, after surgical procedure or trauma." Id., page 7. Finally, the examiner cited Hoon as "teach[ing] the benefits of using multiple markers in detection assays," id., and Hacia as "teach[ing] mutational analysis using oligonucleotide microarrays . . . allow[ing] for unprecedented throughput in mutational analysis with a high degree of accuracy." Id., page 8.

We agree with the examiner that the cited references would have made the method of claim 74 prima facie case obvious. In particular, Quane, AAS and Pharmacogenetics disclose specific mutations that are associated with abnormal responses to commonly used drugs, and which can be identified in patients by genetic analysis.

Quane teaches that malignant hyperthermia (MH) is a potentially fatal complication "triggered in susceptible people by all commonly used inhalation anaesthetics" (abstract), that susceptibility to MH can be predicted by testing strips of muscle tissue in vitro, and that "[o]nce an individual is diagnosed as being susceptible to MH, the anaesthetics which trigger this syndrome can be avoided" (page 471, right-hand column).

Quane also discloses that certain mutations in the ryanodine receptor gene (RYR1) are associated with susceptibility to MH: "a point mutation . . . that results in an Arg to Cys substitution at position 615 . . . has been found in 3-5% of human MH families investigated and is the most common MHS [MH susceptible; see page 471, right-hand column] mutation known to date. More recently, we reported a second MHS mutation, namely an Arg to Cys substitution at position 163 which accounts of 2-3% of MHS cases." Paragraph bridging pages 471-472 (reference numbers omitted). Quane reports that another mutation, Gly341Arg, "accounts for approximately 10% of Caucasian MHS cases." Abstract. Finally, Quane states that the Gly341Arg mutation "satisfies the genetic criteria necessary for demonstration of a causal mutation and as such this mutation should be of significant value for MHS diagnosis by genetic means." Page 474, left-hand column.

AAS teaches that genetic variation in the butyrylcholinesterase (BChE) gene causes patients to react differently to the muscle relaxant succinylcholine: "[T]he better known variants [are known as] A=atypical (dibucaine resistant), F=fluoride resistant, and S=silent (no significant activity)." Page 139, right-hand column. AAS states that succinylcholine (SC) is metabolized quickly in normal patients, so that in patients lacking functional BChE, the standard dose "represents an enormous overdosing" and is "potentially toxic." Page 139, left-hand column.

AAS also teaches that "[a]bout 16 different DNA mutations causing the silent phenotype have been uncovered, so far" (page 140, left-hand column, first full paragraph) and that "[w]e have been able to sequence the entire BCHE coding region and consider all the possible structural mutations using PCR amplification" (page 140, end of the paragraph bridging the columns). Finally, AAS notes that "the principles of molecular biology and their application to BChE variants [have been] well illustrated . . ., and anesthesiologists need to keep up to date about these applications. Other hereditary conditions of special interest to anesthesiologists, such as malignant hyperthermia, may be diagnosed by similar methods in a few years." Paragraph bridging pages 140 and 141.

Pharmacogenetics teaches that the enzyme cytochrome P4502D6 (also known as CYP2D6) is involved in biotransformation of the antihypertensive agent debrisoquine and "at least 30 other agents." Page 310, first and last paragraphs. "[A]pproximately five to ten percent of the individuals in healthy Caucasian populations are distinguishable as phenotypically 'poor metabolizers' (PM)." Page 310, left-hand column, first paragraph. "Codeine and encainide represent examples of drugs that

require metabolic activation by CYP2D6 before certain of their therapeutic effects can be fully realized. Thus, for these drugs it is the PM subjects who may experience therapeutic failure. . . . [C]odeine is therefore an ineffective analgesic in the 5 to 10 percent of the population who have the PM phenotype." Page 317, left-hand column, first full paragraph.

Pharmacogenetics also discloses "the development of rapid and specific PCR-based allele-specific amplification tests to detect the presence of the D6-A and D6-B mutant alleles, and more recently the putative D6-C allele. By combining these with the . . . XbaI RFLP analysis, about 95 percent of all mutant alleles of CYP2D6 could be identified, allowing for the prediction of over 90 percent of PM phenotypes." Page 314, right-hand column, first full paragraph.

Evans and Hacia discuss methods of genetic analysis. Evans states that "[s]ince the cloning and characterization of CYP2D6, human genes involved in many such pharmacogenetic traits have been isolated, their molecular mechanisms have been elucidated, and their clinical importance has been more clearly defined. . . . [T]he overall pharmacologic effects of medications are typically not monogenic traits; rather, they are determined by the interplay of several genes encoding proteins involved in multiple pathways of drug metabolism, disposition, and effects." Page 487, paragraph bridging the columns. Evans provides a list of "[e]xamples of clinically relevant genetic polymorphisms influencing drug metabolism and effects." Table 1.

Evans also discloses that "technology will soon make it feasible to use molecular diagnostics to more precisely select medications and dosages that are optimal for individual patients. In this regard, automated systems are being developed to

determine an individual's genotype for polymorphic genes that are known to be involved in the pathogenesis of their disease, in the metabolism and disposition of medications, and in the targets of drug therapy." Paragraph bridging pages 490 and 491. Evans provides an example of a DNA array for the "detection of functionally important mutations in genes that are important determinants of drug effects"; the exemplified array includes "genes that could influence a patient's response to chemotherapy for acute lymphoblastic leukemia." See Figure 3.

Hacia states that "[o]ligonucleotide array-based detection of known genomic DNA sequence variations was first reported in 1989. . . . Advanced oligonucleotide array manufacturing processes have opened the way to evaluating more complex systems. Arrays of 1,480 oligonucleotide probes . . . were designed to detect 37 known mutations in the coding region of CFTR, as well as all possible single-nucleotide substitutions." Page 42, right-hand column. Hacia also teaches that "[a]mong the greatest strengths of array-based mutational analysis is the ability to detect specific sequence changes of interest. Once specific hybridization patterns or 'signatures' of large numbers of mutant alleles of interest are known, it will be possible to search for those signatures in many different samples simultaneously." Page 45, right-hand column.

We agree with the examiner that these disclosures, viewed collectively by a person of ordinary skill in the art, would have made obvious the method defined by claim 74.[10] That is, it would have been obvious to a person of skill in the art to test a patient who was scheduled for surgery to determine whether the patient had any of the

[10] In our view, the other references cited by the examiner are essentially cumulative to those discussed above.

genetic polymorphisms known to be associated with specific surgery- or anesthesia-related complications, including the RYR1 mutations discussed by Quane, the BChE mutations discussed by AAS, and the CYP2D6 mutations discussed by Pharmacogenetics. The skilled artisan would have found it obvious to conduct such testing (using, for example, DNA hybridization techniques such as those disclosed by Evans and Hacia) in order to avoid the known risk of side-effects, including death, that were likely to occur when patients having a particular genetic make-up were given particular drugs.

Appellant argues that the examiner has not adequately established that a person of ordinary skill in the art would have been motivated to combine the teachings of the cited references. See the Appeal Brief, pages 15-21. Appellant's argument, however, focuses on the teachings of Quane in isolation. A proper obviousness analysis must consider all of the teachings of the prior art, viewed from the perspective of a person of ordinary skill in the art. For the reasons discussed above, we conclude that the references cited by the examiner would have suggested the method of claim 74 to those of ordinary skill in the art.

Appellant also argues that he has provided evidence that rebuts the reasoning relied on by the examiner by showing that "ordinary artisans did not agree with the Examiner's suppositions regarding the obviousness of perioperative genomic profiles." Appeal Brief, page 22. Appellant argues that the APSF Grant Review[11] is evidence of

[11] Appellant states in the declaration filed under 37 CFR § 1.132 on February 8, 2002, that he "filed a grant application entitled 'Perioperative Genomic Profiles' with the Anesthesia Patient Safety Foundation (APSF). . . . The grant application described the subject matter of the present invention and was rejected." ¶ 11. Neither the grant application nor the rejection letter appear to be in the record, although

the nonobviousness of the claimed method, because skilled artisans described it a "tak[ing] the issues of patient safety in a new direction," and stated that "[t]he direction of anesthetic evaluation is presently to not routinely do any preoperative studies." Appeal Brief, page 23.

Appellant argues that Gregory[12] and Kirby[13] teach away from the claimed method in their statements that "routine screening tests are of little value" (Gregory) and "[t]here are abundant data supporting the concept that routine laboratory screening tests are not cost-effective in the asymptomatic patient" (Kirby). Appeal Brief, page 24.

Appellant also argues that Hopkins[14] is evidence that "the Examiner's premises concerning the motivations of the ordinary artisan are in clear error," in that Hopkins states that "[t]he complexity of the molecular genetics of MH described above precludes DNA-based diagnosis at present." Appeal Brief, page 26.

Finally, Appellant argues that his second declaration under 37 CFR § 1.132 (dated July 15, 2002) and the reference attached thereto,[15] are evidence of nonobviousness, in that the "Practice Advisory for Preanesthesia Evaluation . . . does not provide guidelines for selecting markers useful for perioperative genetic testing, and does not advocate, consider or even mention genetic testing, use of genetic markers, or generation of genomic profiles." Appeal Brief, page 27.

---

we will accept Appellant's statement that the quotation in ¶ 11 of the declaration represents "the committee's comments, in full."

[12] Gregory, Pediatric Anesthesia, 4th edition, Churchill Livingstone, NY (2002). Page 184 of Gregory was attached to the declaration filed Feb. 8, 2002.

[13] Kirby et al., Clinical Anesthesia Practice, 2nd edition, W.B. Saunders Co., Philadelphia (2002). Page 12 of Kirby was attached to the declaration filed Feb. 8, 2002.

[14] Hopkins, "Malignant hyperthermia: advances in clinical management and diagnosis," Br. J. of Anaesthesia, Vol. 85, pp. 118-128 (2000)

[15] "Practice Advisory for Preanesthesia Evaluation," Anesthesiology, Vol. 96, pp. 485-496 (2002)

Appellant concludes that "this factual evidence consistently documents that at the time the invention was made, ordinary artisans did not agree with the Examiner's suppositions regarding the obviousness of perioperative genomic profiles." Appeal Brief, page 22.

While we appreciate Appellant's effort to provide evidence supporting his position, we agree with the examiner that the evidence does not overcome the prima facie case of obviousness. The APSF committee's response to Appellant's grant application is not probative of nonobviousness for two reasons. First, the grant application itself is not in the record, so we do not know how the method that was proposed in the grant, and addressed in the committee's comments, compares to the method of claim 74.

Second, and more important, the committee's comments were addressed to the cost-effectiveness of whatever method was proposed in the grant. According to Appellant's declaration (¶ 11), the committee stated that

> [T]he committee members considered the study might improve quality but the cost could be very high. As anesthesia practice has moved toward determining the ratio of quality to cost, this study seems to be going in the opposite direction.

However, whether a claimed invention would have been obvious in the § 103 sense has little to do with whether it would be economically viable in actual practice. A method can properly be considered obvious under § 103 even if it would have been more expensive than alternative methods. See In re Farrenkopf, 713 F.2d 714, 718, 219 USPQ 1, 4 (Fed. Cir. 1983):

> That a given combination would not be made by businessmen for economic reasons does not mean that persons skilled in the art would not

> make the combination because of some technological incompatibility. Only the latter fact would be relevant.

(Citing Orthopedic Equipment Co. v. United States, 702 F.2d 1005, 1013, 217 USPQ 193, 200 (Fed. Cir. 1983).)

In this case, a person of ordinary skill in the art would have found it obvious, in view of the cited references, to test a patient for genetic markers in order to avoid known surgery- and anesthesia-related complications, even though such tests might be expensive, because those skilled in the art would have recognized that the tests were useful for diagnosing patients who were likely to suffer complications if given certain drugs.

The Kirby and Gregory textbooks also do not persuade us that the examiner's rejection is in error. The textbooks suffer from the same deficiency as the APSF committee's remarks. In addition, both textbooks address only "routine laboratory screening tests," which appear to be limited to tests such as urinalysis, hemoglobin and hematocrit. See Gregory, page 184, left-hand column. Neither reference addresses tests for genetic markers such as claimed here.

Hopkins also does not overcome the prima facie case of obviousness. It is true that Hopkins states that the "complexity of the molecular genetics of MH described above precludes DNA-based diagnosis at present [i.e., in 2000]." Nevertheless, Hopkins also states that known mutations were found in a number of MH-susceptible individuals and that "it is difficult to envisage that the mutations so far described in RYR1 do not play a role in MH." Page 125, left-hand column. In any event, Hopkins at best expresses doubt about the likelihood of successfully diagnosing malignant

hyperthermia, but it says nothing to raise doubts about genetic testing for the CYP2D6 or BChE mutations that are disclosed by Pharmacogenetics and AAS, respectively.

Finally, with respect to Appellant's rebuttal evidence, the Practice Advisory attached to Appellant's second declaration suffers from a combination of the deficiencies discussed above: it reflects the cost-benefit trade-offs of the standard of care for present-day clinical practice, which is the wrong standard for determining obviousness under § 103, and it is limited to routine laboratory tests that do not include the type of genetic testing at issue in this case.

Appellant also argues that the cited references do not teach or suggest all of the limitations of claims 74, 76, 78, 81-87, 91-94, 96, 98, 101-103, or 105. Appeal Brief, pages 12-14 and 29-30. However, we agree with the examiner that the cited references would have suggested the limitations of these claims, for the following reasons.

Appellant argues that the references cited by the examiner "fail to teach, suggest or even mention" the following limitations: from claim 74, "a genomic profile for use in selecting a perioperative course of action"; from claim 87, "a genomic profile for use in selecting a surgical treatment course of action"; from claims 94 and 101, "a genomic profile, wherein said genomic profile provides information for use by a physician in determining a risk for complications during a surgical procedure"; and from claim 102 "an assay that detects a first marker in a first gene and a second marker in a second gene to generate assay results, wherein said assay results are consulted in selecting an appropriate anesthesia treatment." Appeal Brief, pages 12-13.

We do not agree with Appellant that these claim limitations distinguish the claimed methods from that suggested by the prior art. With respect to claims 74, 87,

94, and 101, the "genomic profile . . ." claim language merely recites an intended use for the information that is produced during the claimed process. The intended use of the data does not limit the claimed process. See pages 4-5 above.

Claim 102 is somewhat different, in that it recites a step of "subjecting said subject to a surgical procedure, wherein said assay results are consulted in selecting an appropriate anesthesia treatment for said subject." Thus, claim 102 requires considering the assay results during the selection of anesthesia for a patient undergoing surgery. This limitation is suggested by the cited references. For example, Quane states that a Gly341Arg mutation in the RYR1 gene causes sensitivity to malignant hyperthermia, and that "[o]nce an individual is diagnosed as being susceptible to MH, the anaesthetics which trigger this syndrome can be avoided." These disclosures would have reasonably suggested consulting the results of an assay for the RYR1 Gly341Arg mutation and avoiding anesthetics that trigger MH in patients having that mutation. Appellant's argument with respect to claims 86, 98, 103, and 105 (Appeal Brief, page 14) is unpersuasive for the same reason.

Appellant argues that the cited references do not teach or suggest assaying for "5 or more mutations," as recited in claims 84, 92, and 99, or "10 or more mutations," as recited in claims 85, 93, and 100. Appeal Brief, pages 12-13. Appellant also argues that the cited references do not suggest assaying for mutations in at least two of the specific genes recited in claims 83, 91, and 101. See id., pages 12, 13, and 30.

We do not find this argument persuasive. Quane discloses three mutations in the RYR1 gene that are associated with MH susceptibility: Arg to Cys at position 615 (paragraph bridging pages 471 and 472), Arg to Cys at position 163 (id.), and

Gly341Arg (abstract). Pharmacogenetics discloses at least three mutations associated with the "poor metabolizer" phenotype of CYP2D6 (the D6-A, D6-B, and D6-C alleles; page 314, right-hand column). AAS discloses that "about 16 different DNA mutations causing the silent phenotype have been uncovered" (page 140, first full paragraph), along with one causing the "atypical" phenotype and two causing the "fluoride-resistant phenotype" (page 140, second full paragraph).

Based on these disclosures, the skilled artisan would have found it obvious to assay for each of these mutations, which were known to be associated with aberrant drug responses. Thus, those skilled in the art would have found it obvious to assay for at total of at least ten mutations in the RYR1, BChE (butyrylcholinesterase), and CYP2D6 (debrisoquine hydroxylase) genes.

Appellant argues that the cited references do not teach or suggest the added limitations of claim 76, 78, and 96. Appeal Brief, pages 13 and 14. These claims, however, merely further limit the intended use of the information that is produced during the claimed process. Since the intended use of the data does not limit the claimed process (see pages 4-5 above), the language recited in claims 76, 78, and 96 does not distinguish the claimed methods from that suggested by the prior art.

Finally, Appellant argues that the cited references do not teach or suggest a "genomic profile [that] comprises a presymptomatic diagnosis," as recited in claim 81. Appeal Brief, page 13. This argument is also unpersuasive. As discussed above (page 4), the "genomic profile" recited in claim 74 is merely the data resulting from the recited "assay for detecting two or more genetic markers." An assay for the specific mutations disclosed in the cited references would inherently be diagnostic of, among other things,

a potential for an abnormal response to succinylcholine. As AAS states, the "genetically-determined prolonged response to SC in occasional patients is a classical example of a pharmacogenetic condition. Since these individuals . . . [do not] suffer any adverse consequences of this hereditary condition, unless SC or mivacurium is given, the condition is provoked only when the offending drug substances are administered." Page 139, left-hand column. Thus, a presymptomatic diagnosis is suggested by at least AAS.

Summary

The examiner has made out a prima facie case of obviousness, which Appellant has not effectively rebutted. The examiner's rejection is supported by a preponderance of the evidence in the record and is therefore affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

Donald E. Adams)
Administrative Patent Judge)
)
)
) BOARD OF PATENT
Eric Grimes)
Administrative Patent Judge) APPEALS AND
)
) INTERFERENCES
)
Lora M. Green)
Administrative Patent Judge)

EG/dym

Medlen & Carroll, LLP
101 Howard Street
Suite 350
San Francisco, CA 94105